Impacts of Executive Compensation on Employee Wages

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Abstract

We study the impact of CEO equity-based compensation (EBC) on employee wages. Using pay-performance sensitivity (PPS) as a measure for CEO equity-based compensation, we find that CEOs with higher EBC tend to pay their employees lower wages. We also examine the impact of EBC on average employee wage in different industries and find that such an impact is more evident in non-technology firms than in technology firms. Finally, we find that CEOs with higher pay-performance sensitivities are more likely to depress employee wages when the business cycle shows downturn. While the literature of CEO compensation suggests that EBC can mitigate agency conflicts between managers and shareholders, we find that the high level of EBC can create another aspect of agency conflicts between managers and shareholders, contributing to income inequality even within corporations.

Key words: *Income Inequality, Equity-Based Compensation, Pay-Performance Sensitivity, Average Employee Wages, Business Cycle*

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Table of Contents

List of tables

1. Introduction

The income inequality has been a growing social problem worldwide. Widening inequality can be destructive to society by impeding long-term growth.[1] While many studies on income inequality illustrate the wealth difference between the top and the bottom levels in a country, it is more pronounced in developed countries. Lin and Tomaskovic-Devey (2013) point out that the increasing inequality in wages has been playing a significant role in aggravating overall income inequality within the Organization for Economic Cooperation and Development (OECD) countries. Johansson and Wang (2014) point out that suppressive financial policies will aggravate income inequality. Heyman (2005) points out that income inequality might be significant inside modern corporations. The aggravating income inequality is attributed to technology evolution and international trade (Atkinson, 2003; Levy and Temin, 2007).

In the United States, income inequality has become increasingly severe and brought some detrimental effects on social stability since the late 1970s (Lin and Tomaskovic-Devey, 2013). While Milanovic (2012) finds that very high CEO compensation has been gradually and increasingly accepted in the United States since the 1960s, Stiglitz (2012) argues "rent-seeking", where those in power enjoy additional income not from value creation, but from redirecting income attributed to others. We consider whether CEO incentive compensation leads to lower employee wages, potentially contributing to income inequality within the U.S. corporations.

The literature suggests that CEO compensation is important in resolving agency conflicts between shareholders and managers. While shareholders are interested in maximizing their firm values, managers readily pursue their own benefits at the expense of shareholders' interests. Jensen and Meckling (1976) argue that managers with little or no ownership could waste firm's resources for their own benefits away from shareholders' interests. Therefore, agency conflicts become inherent in separation of ownership and control.

[1] See Easterly, W. (2007), Stiglitz, J. (2009), Temple, J. (1999), and Clarke, G. (1995).

The agency conflicts can be reduced by optimal contracts with equity-based compensation (EBC) (Hölmstrom, 1979). When firms tie executive pay to firm performance by granting EBC, the interests of CEOs are better aligned with those of shareholders (Rajgopal and Shevlin, 2002; Mawani, 2003). Murphy (2012) explains that EBC comprises stock options and restricted stock as incentive compensation because EBC leads to a direct positive relationship between the CEOs' compensation and stock-price performance. More specifically, CEOs will have greater motivation to increase stock-price performance. Therefore, EBC gives greater incentives to maximize the shareholders' wealth (Jensen and Murphy, 1990b). However, CEOs with managerial power might still pursue their own interests at the expense of shareholders. Bebchuk and Fried (2003) argue that CEOs extract benefits in excess of what they should receive from incentive contracts, which makes incentive compensation also act as an agency problem.

On the other hand, when CEOs are granted EBC, they might suppress employee wages and decrease expenses to firms. The lower expenses result in higher earnings, leading to higher operating performance and then to higher stock-price performance. Hence, CEO pay out of EBC should increase. That is, CEOs are motivated with EBC to improve firm performance and increase their own compensation. However, CEOs might suppress employee wages more when they are compensated with EBC than when they are compensated with salaries and bonus, which are not directly related to firm performance. Therefore, it is reasonable to posit that CEOs with a higher amount of EBC might curb employee wages more.

However, EBC granted to CEOs will create another aspect of agency conflicts between managers and shareholders. The logic of this statement is as following. Shareholders hire CEOs to work hard for them to maximize the firm value. But when CEOs want to pursue their own benefits, if they cannot increase firm value, they would rather try to curb employee wages. As a result, agency conflicts between managers and shareholders still exist.

To examine the implications above, we collect compensation data from the Execucomp database, stock returns from CRSP, and accounting information from COMPUSTAT. We use panel data methodology, match corporations with work-related data, and investigate how powerful EBC affects employee wages. In terms of the proxy for EBC, we use pay-performance sensitivity (PPS) and pay-volatility sensitivity (PVS) as measures in order to capture the CEO incentive compensation more accurately, consistent with Murphy (2012). However, the relation between PPS and firm performance is still in debate. That is, when PPS increases, firm performance does not necessarily increase. If PPS does not lead to lower employee wages, this could be evidence that CEOs are extracting rents through wage suppression.

The motivation of this paper is to examine whether equity-based compensation encourages managers to exacerbate income inequality by curbing employee wages for their own benefits. Most existing papers, such as Cronqvist *et.al.* (2009), Pagano and Volpin (2005) and Bertrand and Mullainathan (2003) have studied how employee wages respond to managerial powers rather than to EBC. Since there is no study that examines the impact of CEO incentive compensation on employee wages directly, we attempt to contribute to the literature by filling the gap.

The results of this paper suggest that EBC provided to managers has negative impacts on wages of average employees. The higher pay-performance sensitivities managers have, the lower the wages to employees. Moreover, such an impact is greater in non-technology firms than in technology firms and the relationship between EBC and employee wages is also specific to business cycles. CEOs with high PPS are more likely to suppress employee wages in firms which are in a bad state within a business cycle. To reduce income inequality in modern corporations, firms might have to grant EBC to both CEOs and employees.

The remainder of our paper is as follows. Section 2 surveys the relevant literature. Section 3 develops the hypotheses. Section 4 describes the data we used in this study and the empirical models we implement to test the hypotheses and robustness. Section 5 discusses the results and empirical findings. Section 6 presents the conclusion of our study.

2. Literature Review

2.1 Income Inequality

Income inequality has been an unpleasant topic in the United States, Organization for Economic Cooperation and Development (OECD) countries, and all over the world. Levy and Temin (2007) study the growing income inequality in the United States by comparing the situations in earlier postwar years and that since 1980. They propose that income distribution in each of the two periods is driven mostly by economic institutions. They argue that there is not searing inequality in earlier postwar years because of the government regulation of distributing income. Furthermore, the income inequality from the 1980s to the present is due to the policy changes occurring in the late 1970s and early the 1980s, such as changes related to globalization. Venkatasubramanian (2009) investigates the distribution of wages in the United States. The author argues that CEOs are overpaid ridiculously in 2008, and the overpayment leads to the more severe income inequality between managers and average employees. He uses entropy which is a term in statistical mechanics and information theory as a proxy for fairness and then employs the principle of maximum entropy to express maximum fairness in economic systems. The author finally argues that the maximally fair distribution of income is the lognormal one. Lin and Tomaskovic-Devey (2013) focus on the growing income inequality in non-finance industries in the United States and examine how inequality can be influenced by the financialization of the U.S. economy from 1970 to 2008. They argue that the more non-finance sectors rely on financial income, the greater the income disparities among workers of different levels.

Atkinson (2003) investigates income inequality in OECD countries. He argues that in early postwar years, the income inequalities among OECD countries have been falling similarly but experience different rises since the 1980s. Income inequality in the United Kingdom is like a U-shape while that in Canada just starts increasing. The author also proposes that in the 1990s, income inequality in Canada still experienced a slight increase while that in the UK shows almost no change.

Apparently, income inequality is a serious issue existing all over the world. Milanovic (2006) examines the relationship between globalization and worldwide income inequality. He argues that globalization influences income inequality. Such influences depend on whether a country is poor or rich and may be different between densely-populated and underpopulated countries.

There are also studies on the relationship between CEO compensation and income inequality. Kim, Kogut and Yang (2015) propose that since the late 1970s, the main reason for the impressive growth of U.S. income inequality is that the compensation to the top earners has grown even faster than the firm size. Moreover, the top earners are mostly comprised of CEOs. Gabaix and Landier (2008) also point out that CEO pay has increased dramatically between 1980 and 2003. However, Blackwell, Anderson, Hefner and Vaught (2015) investigate the CEO pay and wealth inequality using the data of CEO's salary and total compensation between 1993 and 2013 in the US. They find that CEO compensation has fallen while wealth inequality has risen.

2.2 Agency Conflicts from Separation of Ownership and Control

Agency conflicts are common in many enterprises due to the difference between the goals of shareholders and the goals of managers who have little or no security ownership of the firm (Jensen and Meckling, 1976). In this paper, we confine the cause of agency conflicts to the separation of ownership and control, which is consistent with Berle and Means (1932) and Jensen and Meckling (1976).

Berle and Means (1932) propose that there are many drawbacks when the owner of an enterprise is also a manager. They advocate for the separation of ownership and control. However, such a separation will lead to problems of adverse selection and moral hazard. Jensen and Meckling (1976) argue that when there is separation of ownership and control, managers are not motivated to improve firm performance. Instead, managers will tend to squander corporate resources to maximize their own benefits. Such behaviors of managers will result from the agency conflicts between managers and shareholders of the enterprise.

Jensen (1986) investigates agency conflicts when there is large free cash flow in the firm. He argues that there is divergence of the goals of shareholders and managers. The shareholders want the managers to utilize the free cash to increase the value of stocks, while managers are more inclined to spend free cash on expanding the firm size, which is positively related to their compensation. Moreover, they sometimes invest in some projects with negative net present value (NPV), which can contribute to the growth of firm size. The author also points out that the two methods to mitigate such agency conflicts are issuing debt and threat of takeover.

Fama and Jensen (1983) argue that the agency conflicts caused by separation of ownership and control can be reduced by setting up appropriate organizational forms through both internal and external mechanisms. In terms of internal mechanisms, managers and owners are assigned different tasks. More specifically, managers are responsible for initiating and implementing decisions, while owners are responsible for evaluating and monitoring. Threat of takeover can act as an external mechanism to mitigate such agency conflicts. The bidder can obtain control rights by purchasing stocks. The authors point out that in this way, the agency conflicts can be decreased effectively.

2.3 Structure of CEO Compensation

There is a vast literature that exploring ways to alleviate agency conflicts by implementing CEO compensation schemes. Murphy (1999) separates components of executive compensation by categorizing it into four type: base salaries; bonuses; stock options and restricted stocks; the long-term incentive plans. Murphy (2012) strengthens his previous viewpoint and takes a closer look at the components of the CEO compensation package by also examining non-equity incentives and other pay, such as perquisites. Frydman and Jenter (2010) point out that there was an evolution of CEO compensation occurring during the 1970s and the increase of executive compensation has been witnessed since then. Kaplan (2012) finds out that the CEO compensation level which surged in the 1990s has decreased since then.

There are studies regarding the determinants of executive compensation. Cheng, Venezia and Lou (2013) propose that there is a positive relationship between the CEO's compensation and the extent of internationalization as well as firm size. In contrast, executive compensation level is negatively related to the degree of industrial diversification. Gabaix and Landier (2008) set up an equilibrium model to determine whether the substantial enhancement in firm size will lead to the rise in CEO compensation. They propose that from 1980 to 2003, the increment of total market capitalization, which is used as proxy for the firm size, of large corporations can well explain the growth of CEO compensation in the United States. By using Indian firms as the data sample, Parthasarathy, Menon and Bhattacherjee (2006) provide evidence that not only CEO total compensation but also the fraction of incentive compensation to total compensation has significantly positive impact on firm size, which is used as a control variable in their study.

In terms of riskiness, Holmstrom and Milgrom (1987), Kraft and Niederprüm (1999), and Garen (1994) all provide evidence that increasing the risk of the firm should reduce the level of CEO compensation. Also, different compensation components relate to firm risk differently. Jin (2002) conducts a further study to test the relation between executive compensation and risk level by categorizing risk into systematic risk and non-systematic risk, which is also known as firm-specific risk. He argues that CEO compensation decreases when the firm-specific risk increases. However, it is hard to examine how systematic risk influences the incentive level. Nohel and Todd (2004) suggest that managers' incentives to invest are complex issues and are closely related to the option strike prices, the degree of risk aversion of managers, the career concerns of the executives as well as managers' current and future wealth.

On the other hand, Graham, Li and Qiu (2012) suggest that in addition to the observable firm and managers' attributes (such as firm size and managers' age), the latent ones are also significant influencing factors on the executive compensation level. Bathala (1996) suggests that CEO's equity ownership, especially equity-based compensation (EBC), is conducive to reducing agency costs. The author then takes a closer look at the influencing factors of the CEO's stock ownership and finds that the corporation's level of debt and free cash flow have a positive impact on the CEO's stock ownership, while firm size has a negative impact on the CEO's stock ownership. This finding is somewhat surprising and contradictory to the conclusions of Parthasarathy, Menon and Bhattacherjee (2006). However, their variables are not synchronous as the dependent variable (the CEO's stock ownership) and some independent variables (such as firm size) were measured in different time periods. Moreover, Chung and Pruitt (1996) study the interaction of the CEO's pay and firm performance. The authors perform a three-stage least-squares (3SLS) regression model to resolve the endogeneity problem of independent variables and find that managerial stock ownership and firm value influence each other. Chemmanur, Cheng and Zhang (2013) propose that in firms, leverage has a significantly positive effect on the CEO's total compensation, cash compensation as well as equity-based compensation (EBC).

There is a heated debate among these authors on whether the CEO compensation level is reasonable. Bebchuk and Fried (2005) suggest that the compensation to managers should be open to the public. They find that there is little effect of CEO compensation on the shareholders' wealth and suggest that the level of CEO compensation should be limited. Moreover, due to the enterprise management scandals, which have become prevalent since 2001, the public is convinced of the phenomenon that the existence of CEO compensation may not actually serve the interests of shareholders. On the other hand, several studies also propose that the CEO compensation is not excessive. Murphy (1986a) points out that on average, the compensation package does indeed motivate managers to act in the interest of shareholders. Accordingly, managers are not overpaid. Parthasarathy, Menon and Bhattacherjee (2006) suggest that in the firms which are regulated by the government, CEOs are underpaid. Furthermore, Jensen and Murphy (1990b) suggest that the blame of public for the high pay to CEOs is irrational. They argue that the compensation level is actually decreasing, and such phenomena never should have happened because the compensation scheme is very significant in alleviating agency problems to corporations.

There are two approaches to the study of executive compensation. The more widespread method is the optimal contracting approach, under which CEOs are given incentive contracts to maximize shareholders' value. Murphy (1986b) extends the incentive contracts to more than two periods and strengthens the concept of the optimal contract. However, some studies find that there are limitations to the optimal contacting approach. Bebchuk and Fried (2003) argue that there is an agency problem not only between the shareholders and the CEOs, but also between shareholders and directors. Directors always act on behalf of the CEOs because CEOs have the right to appoint directors and decide their rates of pay (Bebchuk, Fried and Walker, 2002; Main, 1993). Shivdasani and Yermack (1999) provide evidence of the alignment between directors and executives by illustrating that when CEOs attend the process of nominating directors, the directors are more likely to be on the side of the CEOs. While the compensation scheme for directors is still in debate, we focus only on the issue of CEO compensation.

The other approach to explore CEO compensation is the managerial power approach, under which the compensation package can be in part an agency conflict itself. The managers have power to affect pay to themselves and as a result they have the ability to extract rent, which is the compensation above what they deserve to receive through the optimal contract. Bebchuk, Fried and Walker (2002) propose that managers' extraction of rent can result in inadequate compensation schemes and suboptimal contracts.

Bebchuk and Fried (2004) considered the emergence of managers' power as proof that the contract is not optimal and thus the reform of CEO pay is needed. Core, Guay and Thomas (2005) put forward some contrasting views. They argue that the two approaches are not mutually exclusive. They suggest that when CEOs are more powerful, it does not necessarily mean that the compensation policy needs to be fixed. There is also a dispute about whether government intervention is essential in this issue. While Bebchuk and Fried (2004) propose a supportive perspective to government intervention, the views of Core, Guay and Thomas (2005) are quite the opposite. They point out that, when taking the rise of executive compensation into consideration, government intervention cannot be proved to be essential. In contrast, Murphy (2012) demonstrates that the government intervention into executive pay is the inevitable choice in the historical development of CEO compensation. While there are several aspects of executive compensation, we only focus on the EBC because other components in executive compensation do not provide managerial incentives.

2.4 Equity-Based Compensation (EBC)

While studies have examined different components of CEO compensation, EBC is more efficient to align the goals of shareholders and CEOs than other components of compensation (Jensen and Murphy, 1990a; Murphy, 1999; Walker, 2011). Jensen and Meckling (1976) demonstrate that enhancement of manager's equity ownership will prevent them from abusing corporate resources, which are otherwise used to increase their own perquisites and build their business empire. In this way, firm value will increase, which is the goal of shareholders, and thus the agency costs will be reduced. Fama (1980) proposes that in order to resolve the conflicts which such separation may bring about, the best solution is to give managers stocks as an incentive contract. In addition, he argues that the concept proposed by Jensen and Meckling (1976) that the corporation is a set of contracts needs to be promoted. He made modifications to the view of the "firm as a set of contracts" by noting that there is also a separation of management and risk taking. Thus, opportunism and moral hazards will come into being. In his opinion, these problems can be solved by setting up an efficient managerial labor market because the current performance of managers will influence how much pay they will receive in the future. In this way, he illustrates that the separation of ownership and control rights is an effective organizational form.

Ofek and Yermack (2000) investigate the varying degrees of efficacy of different levels of equity-based compensation. The authors use the compensation data sample from 1992 to 1995 to test such relationships and find that the quantity of stocks owned by managers changes dynamically based on two forces. The first one is the board's goal to align the interests of managers with those of shareholders by using equity-based compensation. The second force is the managers' desire to diversify risk by selling stocks. They illustrate that, when the level of managerial ownership is low, granting EBC can motivate managers to act on behalf of shareholders. However, when managers already own a large number of shares and they are given new equity compensation, they tend to sell shares that they already own in order to diversify risk. As a result, EBC loses its effectiveness. Berger, Ofek and Yermack (1997) use a panel data set of 434 firms to investigate the relation between the CEO's stock ownership and capital structure decisions. They document that when managers are given more EBC, they tend to select the capital structure with higher leverage, which will be more likely to increase their firm value.

There are studies on the relationship between the fraction of stocks owned by managers and the firm's market value. However, the conclusions vary. Morck, Shleifer and Vishny (1988) split board ownership into three categories and then employ a piecewise linear regression model to estimate the relation between the fraction of stocks owned by managers and Tobin's Q. They find that the relation is not monotonic. The authors illustrate that Tobin's Q goes up when ownership is between 0% and 5%, then down between 5% and 25% and then up until the end. In a related study, McConnell and Servaes (1990) find that the relation between the fraction of stocks owned by managers and Tobin's Q follows a smooth curve and Tobin's Q keeps increasing at a descending rate as long as the CEO's stock ownership is below approximately 45%. After the stock ownership reaches about 45%, Tobin's Q decreases at an increasing rate. Later, Hermalin and Weisbach (1991) use a similar method to that of Morck, Shleifer and Vishny (1988), but take into account the tenure of managers. They show something different from previous findings. They find that the relation is a more perplex curvilinear relation with Tobin's Q as the dependent variable. The slope is positive when the ownership grows from 0% to 1% and 5% to 20%, and negative when the ownership is between 1% and 5% and bigger than 20%.

However, there are some studies which provide puzzling conclusions. For example, Lorderer and Martin (1997) use the data of 867 domestic acquisitions to test the importance of stock-based incentives. They find that there is no evidence to support the hypothesis that firm performance, which is related to shareholders' wealth, increases with the higher stockholdings of CEOs. In their study, high stock ownership by CEOs leads to more severe appropriation of corporate resources.

Mehran (1995) examines circumstances under which more EBC will be granted to CEOs and finds that the EBC package increases with a growing number of outside directors and decreases with the existence of large outside shareholders, who can oversee CEOs without using incentive contracts. Mehran (1995) also shows that both high firm performance and more growth opportunities are positively correlated to the high percentage of EBC in the total compensation package, as well as to the high fraction of shares owned by managers.

Ryabkov (2014) studies the optimal compensation model and shows that, in the EBC package, stock options are superior to stocks given to the managers due to two reasons. First, granting more stock options rather than stocks can save shareholders some more expenses. Second, stock options will give managers more risk-taking incentives compared to stocks. Core, Guay, and Larcker (2003) also propose that stock options are a significant element not only of total CEO compensation, but also of EBC to CEOs. However, Walker (2011) suggests that, from the beginning of 2006, stocks replaced stock options to play a vital role in the EBC package. However, it is difficult to explain why such an evolution arises because the change might be related to characteristics of firms, their employees, or the market as a whole.

Edmans *et al.* (2012) use a dynamic model to illustrate how to make an efficient optimal contract in the dynamic world. They point out that the EBC package given to managers cannot motivate them all the time. When there is a situation in which the firm value declines, EBC will lose its value and thus CEOs will find ways to maximize their personal savings. Under such circumstances, the incentives given by EBC will decrease substantially. By conducting a dynamic incentives contract, CEOs will be given constant motivations both in the present and the future.

Laux and Laux (2009) examine the relations among board committees, EBC and the audit committee on the basis that there exists a good reaction mechanism. They conclude that the separation of the rights of setting CEO compensation and monitoring managers will result in high EBC. The authors argue that such high levels of compensation may not cause high levels of earnings management in turn, because the audit committee will spend more effort monitoring CEOs.

2.5 Measures of Equity-Based Compensation (EBC)

Inspired by Murphy (2012), we measure EBC through two ways: pay-performance sensitivity (PPS) and pay-volatility sensitivity (PVS). In terms of the definitions of PPS and PVS, we follow the viewpoints proposed by Core and Guay (2002). PPS is defined as the "Dollar change in the CEO's wealth associated with a 1% change in the firm's stock price". PVS is defined as the "Dollar change in the CEO's wealth associated with a 0.01 change in the annualized standard deviation of stock returns".

According to the compensation package, there are two calculation methods: "grant-date pay" and "realized pay" (Murphy, 2012; Kaplan, 2012). Kaplan (2012) suggests that "realized pay" should be utilized because it does a better job of capturing the value of stock options that CEOs actually receive. There are also other studies using ‘grant-date pay’ as the proxy. For example, Bebchuk and Grinstein (2005) utilize the grant-date value of the compensation package to examine the growth of CEO pay.

PPS increased dramatically in the 1990s. This is mainly driven by the sharp growth of stock options holdings (Frydman and Jenter, 2010; Murphy, 1999). There are many studies finding a positive relation between the CEO’s pay and firm performance. Kaplan (2012) argues that pay to CEOs is positively correlated with firm performance. In order not to be penalized, CEOs attempt to improve firm performance. Hall and Liebman (1998) investigate pay-performance sensitivities by constructing a panel data set of hundreds of large public companies from 1980 to 1994. The authors put forward the view that the CEO’s pay is strongly positively related to firm performance. They also point out that high pay-performance sensitivities are almost completely explained by equity-based compensation. Murphy (1985) combines the cross-section data and time-series data and then sets up the regression of CEO’s pay from six categories of total compensation on firm performance, which is measured by sales growth and common shareholders returns instead of accounting profit. The author provides evidence that CEO’s pay is significantly positive to firm performance after controlling for various firm characteristics.

Conyon and Peck (1998) reach a conclusion that the correlation between pay and performance is higher when outsiders are playing a leading role in boards and remuneration committees. Following the method of Jensen and Murphy (1990a) used to measure PPS, Yermack (1996) examines the relation between board size and EBC. The author finds that the corporation with a small boards tends to have a larger firm value and higher PPS. Kraft and Niederprüm (1999) study the relation between pay-performance sensitivities and ownership structure. More specifically, they point out that pay-performance sensitivities are smaller when there is a large shareholder playing a predominant role.

Jensen, Murphy and Wruck (2004) propose that it is better for firms to conduct a linear pay-performance relationship because either a convex or concave one will produce problems. The most severe problem is that the managers will not always pursue the maximization of firm value to attain the highest pay. More recently, Abedin and Pyo (2015) examine the relation between PPS and firm performance and find that PPS is positively related to firm performance.

However, there are some studies providing some puzzling conclusions. Jensen and Murphy (1990a) use a dataset of 10,400 CEOs from 1,295 companies from 1974 to 1986 to examine the relation between the CEO's pay from different components of compensation and firm performance. They employ the ordinary least square (OLS) regression model and then provide evidence that pay-performance sensitivities are small. With regard to many big firms, the CEO's pay is independent of firm performance so that there is a lack of efficient incentive mechanisms. The authors attribute the weak connection between pay and performance to the combination of many factors, such as political stress and firm size. They propose that small firms tend to have higher pay-performance sensitivities. Parthasarathy, Menon and Bhattacherjee (2006) study the relation between executive pay and firm performance by using net profit margin (NPM) and return on assets (ROA) as proxies for firm performance. They find that there is no relation between either the total executive pay or the fraction of incentive pay to total pay and firm performance. However, Murphy and Jensen (2011) propose several precautions about deciding pay-performance sensitivities. They argue that using ratios such as ROA, earnings per share (EPS), and return on equity (ROE) to measure firm performance is questionable because managers may only care about how to manipulate such ratios.

Despite many advocates of aligning pay to performance, some studies question the rationality of that practice. Cooper, Gulen and Rau (2014) regress the one-year-ahead measures of stock performance and operating performance on the total compensation minus total cash compensation, which is used as a measure of the CEO's incentive pay in the current year after controlling for the influence of managerial style in the model. They find that high executive pay has an adverse impact on future stock performance and operating performance. Nohel and Todd (2004) argue that using pay-performance sensitivities to measure CEO compensation is flawed because when pay-performance sensitivities are high enough for the managers, motivation for managers to increase their firm value will decrease.

Michaud and Gai (2009) examine the reciprocity between CEO pay and firm performance. When they set firm performance as the dependent variable, they find that it has little relation with executive compensation. The authors then study the impact of firm performance on CEO pay and document that the impact is small. Moreover, the firm size, which is measured by sales, is the vital determinant of CEO pay.

Now we move forward to discuss the existing research on the other measure of EBC: pay-volatility sensitivity (PVS). Recall that the separation of managers' control and ownership will lead managers to forgo risky projects even though they may have positive net present value (NPV). Rajgopal and Shevlin (2002) propose that the CEO's incentive pay is positively associated with stock return volatility. Therefore, EBC can induce managers to invest in risky projects which will result in higher volatility and then higher CEO pay. In addition, the authors also find that there is a significant positive relation between cash compensation and PVS. More specifically, higher PVS lead to higher cash compensation.

Core and Guay (2002) investigate the methods of deriving the stock option portfolio value and the sensitivities of the option value to stock price and return volatility. For convenience, the authors use the 'one-year approximation' (OA) method to do the estimation which means getting access to data only from the current year's proxy statement or annual report. They argue that the 'one-year approximation' method is better and has fewer errors when compared to other methods. Coles, Daniel and Naveen (2006) employ a three-stage least-squares (3SLS) regression model to study PVS by controlling for PPS and including firm variables such as investment policy and leverage. The authors provide evidence that higher PVS will lead to much riskier investment policies and higher leverage. In addition, risky policies will lead to higher PVS but lower PPS in turn. They also point out that the stock return volatility has a positive impact on both PPS and PVS. Benson, Park and Davidson (2014) use mergers and acquisitions (M&As) as a tool to investigate the effects of sensitivity of the CEO's pay to stock return volatility. They find that PVS is positively related to the probability of industrial diversification and negatively related to post-merger equity risk. More specifically, high PVS will result in the high likelihood of acquiring a target firm from a different industry and will generate a lower equity risk after the merger happens. While we do not expect PVS to have material impacts on employee wages, we still consider PVS relative to employee wages because PVS is an important measure of managerial incentives with PPS.

2.6 Employee Wages Relative to Capital Structure

There are far fewer existing studies on employee wages than on executive compensation. From the prior literature on employee wages, we find that, in addition to executive compensation, the quantity of lower-level employee wages is also influenced by many aspects. Chemmanur, Cheng and Zhang (2013) argue that firm leverage has a significantly positive influence on average employee pay. The authors also point out that such an influence is more obvious in nontechnology firms when compared to technology firms. Berk, Stanton and Zechner (2010) investigate the optimal labor contract for the levered firms. In levered firms, bankruptcy costs, which are borne by employees, can offset the tax shields of debt. Therefore, firms with higher leverage have more labor risks, and thus will pay employees higher wages. The authors also find that firms with substantial capital tend to pay employees more.

Hovakimian and Li (2011) examine the effect of capital structure on employee wages by using Chinese firms as the data sample. They set up a two-stage least-squares (2SLS) regression model and find evidence that firms with more debt tend to pay lower employee wages, which is consistent with Hanka (1998). The authors also find that firm size and profitability are two critical factors influencing employee wages. More specifically, smaller firms and less profitable firms are more likely to pay lower employee wages than other firms.

Bell and Reenen (2011) classify workers into four categories: CEOs, senior managers, junior managers and average employees. They then investigate the impact of firm performance on the wages of workers. They find that the wages of senior managers are more sensitive to firm performance, while the sensitivities of the wages of junior managers as well as average employees to firm performance are quite low. With regard to CEOs, lower firm performance will lead to lower CEO pay and the higher possibility of being fired.

Bae, Kang and Wang (2011) investigate the influence of the firm-employee relationship on the capital structure decision. They find a negative relation between firm leverage and employee benefits. More specifically, the lower the ability to treat employees well, the higher the firm leverage is. Moreover, such a relation is more outstanding in firms, which encounter the financial crisis, and also in which employees are playing a significant role in the corporation's operation.

2.7 Employee Wages Relative to Managerial Powers

Except for the influence of capital structure on employee wages, many researchers have also tested the impact of managerial powers on employee wages within corporations. Generally, the variation of managerial power will lead to different levels of employee wages.

Cronqvist *et.al.* (2009) use panel data including firms, subsidiaries and workers levels to examine the effect of managerial entrenchment on employee wages. They consider CEO control measured by voting rights and CEO incentives measured by cash flow rights as proxies for the degree of managerial entrenchment. The authors provide evidence that more powerful managers pay their employees higher wages in order to get some personal benefits. The worker-level data also helps the authors investigate what kinds of employees can enjoy greater benefits from entrenched managers. While powerful CEOs can pay their employees more for CEOs' personal benefits, CEOs with a higher PPS might pay their employees less because they might not be able to appreciate personal benefits as do powerful CEOs.

However, there is a heated debate between managers and shareholders about whether to grant high employee wages. Pagano and Volpin (2005) argue that managers with more control and less stock ownership are motivated to pay their workers more. Such policies can protect the firm from being taken over. In this way, there is an alliance between managers and employees when faced with corporate raiders. They also propose that the employees are motivated to protect high wages. Thus, higher wages leads to a stronger alliance between managers and employees, particularly when employees also own shares of the firm. However, shareholders whose goal is to maximize firm value may be the opponents of such practice. The authors' viewpoints are consistent with that of Bertrand and Mullainathan (2003), who also illustrate that workers' wages will increase when the possibility of being taken over is lower. Bertrand and Mullainathan (1999) employ a 'differences-in-differences' method to estimate the effect of anti-takeover legislation on employee wages. They follow the view of Jensen (1986), where takeover is a feasible way to mitigate agency conflicts. Therefore, they deduce that anti-takeover provisions will increase managerial discretion. Thus, the effect exerted by anti-takeover laws can measure the level of managerial discretion to some extent. Finally, the authors provide evidence that anti-takeover laws lead to the growth of employee wages. Rather than studying the determinants of employee wages in general, we only focus on how equity-based compensation influence average employee wages.

We examine whether EBC will curb employee wages, even though it is efficient in mitigating agency conflicts inherent in separation of ownership and control. Thus, the wage inequality created by EBC within corporations might be more severe and furthermore might exacerbate income inequality within the whole society.

3. Hypothesis Development

Recall that when the rights of control and ownership are separated, managers will take advantage of the principal's authorization to increase their own benefits instead of pursuing the maximization of corporation value and shareholders' wealth, which will thus cause the agency conflicts between managers and shareholders. Also recall that granting equity-based compensation to managers can help alleviate such agency conflicts by aligning the interests of managers and shareholders.

Therefore, when CEOs are granted high equity-based compensation (EBC), they are motivated to increase the firm performance. CEOs are more willing to restrain employee wages because the firm performance can be enhanced in this way. More specifically, we can explain this through the income statement of a firm. When the employee wages are suppressed, the expenses will be reduced and then the profits will go up relatively. The growth of the firm profits indicates that the firm performance increases as well. Hence, CEOs with high EBC will receive more compensation than they deserve.

While employees' productivity might decrease due to the suppression of their wage, CEOs can still control the extent of the suppression for own benefits of EBC. For example, they can reduce the rate of increase in wages when they receive more EBC relative to when they receive less EBC. In the literature of CEO compensation, it is still hard to establish positive relations between EBC and firm performance. That is, CEOs with powerful EBC packages might allow calculated losses in employees' productivity and still enjoy their own lucrative compensation at the expense of their low level employees by suppressing wages. In the absence of explicit positive relations between EBC and firm performance, CEOs might be interested in their own compensation more than employees' compensation and then suppress employee wages.

Therefore, Hypothesis 1 is:

H1: There is a negative relationship between pay-performance sensitivities and employee wages. More specifically, CEOs with higher pay-performance sensitivities pay their workers lower wages.

Cronqvist *et.al.* (2009) provide some related evidence to reinforce our Hypothesis 1. They propose that higher managerial entrenchment can lead to higher employee wages. The authors use an indicator variable in their model to measure the power of control and then point out that when the managers own more control rights, they are more entrenched. Therefore, these managers tend to grant higher workers' pay in order to maintain a good relationship between them and employees. However, financial incentives may mitigate such behavior.

To test Hypothesis 1, we set up the model by using PPS as the measure of EBC to the manager. In addition, leverage is a significant firm characteristic in our model when testing how EBC influences employee wages. So we set firm leverage as a main control variable.

When a firm is highly leveraged, it is more likely to go bankrupt. Employees might ask for higher wages to be compensated from higher probability of bankruptcy. Myers (1977) first proposes one of the bargaining tools. He points out that when the firm is issuing debt, there always exists an underinvestment problem. The managers tend to give up some projects even of positive NPV because most of benefits are enjoyed by the creditors. Such an underinvestment problem can be used as a bargaining tool by the firm. Therefore, risk-averse employees will demand high wages as compensation before the negotiation starts. Perotti and Spier (1993) also propose that leverage can be used by the firm to bargain with the employees over their wages.

Chemmanur, Cheng and Zhang (2013) provide evidence of the positive impact of firm leverage on average employee wage by conducting several empirical models. They also find that such an impact is significant. Hence, we examine Hypothesis 2 to see whether the relation found by Chemmanur, Cheng and Zhang (2013) still holds in the existent of EBC to CEOs.

H2: There is a positive influence of firm leverage on average employee wages in the existence of EBC granted to CEOs.

There is some existing literature studying the EBC as well as the relation between capital structure and employee pay within different industries. Several researchers (Anderson, Banker and Ravindran, 2000; Murphy, 2003) point out that in technology firms, managers own a greater fraction of stock options to total compensation. They also argue that such a difference is produced by many economic aspects.

Chemmanur, Cheng and Zhang (2013) examine the influence of leverage on employee wages while taking the industry into consideration. The authors categorize firms into technology and nontechnology firms and then examine the CEO compensation in these firms respectively. They find that CEOs in technology firms can obtain more total compensation on average and nontechnology firms tend to have higher firm leverage. The authors also argue that the impact of leverage on employee wages is greater in nontechnology firms.

Therefore, we can expect that the incentive schemes in various industries, especially the EBC package, are different and that the impact of capital structure on average employee wages is different as well. Recall that capital structure of the firm also influences EBC.

Therefore, we are interested in differential impacts of EBC on employee wages among industries in technology or non-technology.

Hence, hypothesis 3 is:

H3: The relationship between pay-performance sensitivities and employee wages is specific to industries related to technology or not.

EBC package is an efficient incentive plan for CEOs, but the value of such a compensation package changes all the time within different business cycles. Yang (2005) investigates the agency conflicts and corporate governance under different business conditions. The author argues that in the good states of business cycles, shareholder rights can contribute to decreasing managerial discretion, especially when there is free cash flow. However, in the bad states, shareholder rights will cause the more serious agency conflicts between creditors and shareholders. The author also argues that the debt structure changes within business cycles.

In addition, the bankruptcy possibility varies in different states of business cycles. More specifically, when in the good states, the firm bankruptcy probability is low and the situation is quite contrary when the economy moves to bad states. Such circumstances will also influence the extent that firms bargain with employees for their wages.

Chemmanur, Cheng and Zhang (2013) utilize Z-score to express the probability of a corporation going into bankruptcy and then categorize the companies in their dataset into financially safe companies and financially distressed companies. They find that the influence of firm leverage on average employee wage is significant in financially safe companies but insignificant in financially distressed companies.

As discussed above, EBC package given to CEOs and the impact of capital structure on average employee wage will keep changing according to different states of business cycles. Likewise, it is reasonable to conjecture that the impact of equity-based compensation on employee wages is also different within the business cycles. However, there is limited literature about this issue. Therefore, we set up Hypothesis 4 to fill this gap.

H4: The relationship between pay-performance sensitivities and employee wages is specific to whether the economy is in good state or bad state.

4. Data and Methodology

4.1 Data

We use compensation data during the period from January, 1992 to December, 2014. The identification of CEO is found through “CEOANN” variable in Execucomp database. Recall that we use pay-performance sensitivity (PPS) and pay-volatility sensitivity (PVS) to measure CEO equity-based compensation (EBC). Our data of compensation to CEO are collected from Execucomp database. When calculating PVS, our data of stock return to shareholders are collected from CRSP database. Because the main identifier for the firms in Execucomp is “GVKEY” and “CUSIP” variables while that in CRSP is “CUSIP”, we merge Execucomp and CRSP databases using the “CUSIP” variable. It is worth mention that the data in the Execucomp database before 2006 and after 2006 has different reporting formats. So our calculation method of CEO compensation is also different for 1992-2006 and 2007-2014. In addition, to calculate the option value using the Black-Scholes-Merton model, we obtain risk-free rate from historical data provided by the Federal Reserve on their website for “Treasury constant maturities” using the “annual” series. Consistent with the prior literature, we eliminate finance firms and utilities because such firms have different operating mechanisms and regulatory policies when compared to the others.

We use “COPEROL” and “YEAR” variables to identify the cross-section and time series in our panel data set, respectively. To avoid the huge numerical difference among the variables in our regression model, we take the natural log of pay-performance sensitivities in our empirical work. After deleting the missing values of the natural log of PPS, we have 34,248 firm-year observations during the sample period. In terms of the computation of employee wages, we use the natural log of average employees pay which is calculated as “Labor and related expenses” (XLR, data item 42) divided by “The number of employees” (EMP, data item 29), variables provided by COMPUSTAT database. We use the “employee wages” variable to represent the total labor costs.[2] There are 49,842 firm-year observations containing the average employee information from 1992 to 2014. Because only approximately ten percent of firms report “Labor and related expenses” (XLR, data item 42) in COMPUSTAT, the problem of sample-selection bias will be generated. More details regarding this problem will be discussed in section 4.4.

We collect annual data on firm characteristics from COMPUSTAT during the time period of January, 1992 to December, 2014, which include “Total Assets” (AT, data item 6), “Number of Common Shares Outstanding” (CSHO, data item 25), “Close Price of the Company’s Stock for the Fiscal Year” (PRCC_F, data item 199), “Total Long-term Debt” (DLTT, data item 9), “Total Debt in Current Liabilities” (DLC, data item 34), “Net Sales” (SALE, data item 12), “Earnings Before Interest and Taxes” (EBIT, data item 178) and “Retained Earnings” (RE, data item 36). We also include some important control variables in our regression models which will be discussed more in section 4.2-4.7. We estimate firm size using the natural log of market capitalization which is calculated by multiplying a company’s number of shares outstanding by the current market price of one share. Following the method used by Leary and Roberts (2010), we measure leverage as market leverage ratio which is calculated by the total debt (DLTT+DLC) divided by the sum of total debt and market value of equity (CSHO× PRCC_F). We use market-to-book ratio of the firm to gauge the investment opportunities of the firm, which is defined as market value of assets to book value of assets (Coles, Daniel and Naveen, 2006). Following Chemmanur, Cheng and Zhang (2013), we compute the physical capital intensity as the gross property, plant and equipment scaled by total assets (PPEGT, data item 7/AT, data item 6). Physical capital intensity is also used to capture the growth opportunities of the firm. Quits rates[3] of different industries from 2001 to 2014 are collected from the database of Job Openings and Labor Turnover Survey (JOLTS) provided by the U.S. Bureau of Labor Statistics. The industry classification which JOLTS uses is based on the North American Industry Classification System (NAICS). In order to capture the industry effects in our regression

[2] According to the variable explanation stated by COMPUSTAT, data item 42 contains not only employee wages and salaries, but also incentive compensation and other benefit plans, hence actually, we include several types of employee pay in our “employee wages” variable.
[3] The quits rate is the number of quits (voluntary separations) during the entire year as a percent of annual average employment.

models, we implement the Fama and French 48-industry classification method to categorize firms into several different industries using the Standard Industrial Classification codes and then construct the industry dummies.

Table 1 presents the descriptive statistics of key variables used in the regression analysis of the determinants of employee wages. The dependent variable, average employee pay, has a mean of $75,990, a median of $57,503, and a standard deviation of $71,936. Chemmanur, Cheng and Zhang (2013) use information on employee wages from 1992 to 2006. According to their results, the average employee pay has a mean of $32,760 and a median of $32,000. The descriptive statistics of average employee wage are different between their study and ours because we have different industry distribution of data samples. Increases in labor expenses since 2006 might be another reason for the difference. The main independent variable, PPS, has a mean of $879,276 and a median of $205,999. The mean number implies that the average CEO's wealth changes by $879,276 per 1% change in their firms' stock price. Coles, Daniel and Naveen (2006) examine the PPS of the CEO from 1992 to 2002. According to the summary statistics provided by them, PPS has a mean of $600,000 and a median of $206,000. Distinct time periods of our data samples cause distinct summary statistics of PPS. More specifically, the increase of PPS since 2002 can bring about the data difference. Since powerful CEOs have been heavily granted with EBC, their pay-performance sensitivities influence mean PPS more than median PPS. Therefore, it is feasible to focus on the median rather than the mean of PPS to analyze the incentive compensation of CEOs (Frydman and Jenter, 2010).

Table 2 shows the sample correlations of key variables used in the analysis of the impacts on employee wages. We note that nearly all of the correlations of any of the two different variables are significant at the 1% level, which means that changes in one variable significantly relate to changes in the another variable. "Wage" and "Avgsale" has a correlation coefficient of 0.684, which means these two variables have a strong relationship. The absolute value of coefficients of correlations of "PPS" and "PVS", "Size" and "PPS", "Size" and "PVS", "Leverage" and "MTB" are between 0.4 and 0.59, which means the variables have a moderate degree of correlation. The absolute value of coefficients of correlations of all other each two variables are all smaller than 0.39, which means they have a weak relationship with each other.

Table 3 shows the distribution of the firms with data on employee wages based on the two-digit Standard Industrial Classification (SIC) industry classification. There are 3,733 unique firms reporting the labor expenses in our data sample. The "Manufacturing" companies have the largest proportion among all the firms, which is 28.93%. Table 4 reports the average employee pay among different industries. We find that the workers in "Construction" industry tend to have the highest average wage and the workers in "Wholesale Trade" industry tend to have the lowest average wage. In addition, the average wage in "Transportation" grows sharply since 2000.

4.2 CEO Equity-Based Compensation (EBC)

In order to capture EBC packages to CEOs more precisely, we measure them as the sensitivities, not the exact number of total amount of EBC, in the sense that the amount of EBC granted to different CEOs changes as a result of their transactions such as selling stocks or exercising stock options to raise cash for CEOs. More specifically, CEOs with high EBC but less transactions and CEOs with low EBC but more transactions might show the same amount of compensation. However, the pay-performance sensitivities and pay-volatility sensitivities will always remain different for different CEOs, which is why we use PPS and PVS to gauge EBC to CEOs.

When we estimate PPS and PVS, we first calculate the option value following the method proposed by Core and Guay (2002) which is based on the Black-Scholes (1973) model for European call options and modified by Merton (1973) to add the dividend item.

$$\text{Option value} = [\mathrm{S}e^{-dT}\mathrm{N}(\mathrm{Z}) - \mathrm{X}e^{-rT}\mathrm{N}(\mathrm{Z} - \sigma\sqrt{T})] \quad (1)$$

where $\mathrm{Z} = \left[\ln\left(\frac{S}{X}\right) + \mathrm{T}\left(\mathrm{r} - \mathrm{d} + \frac{\sigma^2}{2}\right)\right] / \sigma\sqrt{T}$, N = cumulative probability function for the normal distribution, S = price of the underlying stock, X = exercise price of the option, σ = expected stock-return volatility over the life of the option, r = risk-free interest rate, T =

time to maturity of the option in years, d = expected dividend yield over the life of the option.

Then we are able to calculate Delta for stock options, using the Black-Scholes-Merton model. To compute the overall Delta for each CEO-year, we add up the Delta of all vested and unvested tranches of options and the Delta of shares. For the overall Vega, we sum up the Vega of all vested and unvested tranches of options.[4]

Therefore, PPS (sensitivity with respect to 1% change in stock price) is estimated as:

$$\left[\frac{\partial(\text{Option value})}{\partial(\text{Stock price})} + \#Shr.own\right] \times \left(\frac{\text{Stock price}}{100}\right)$$

$$= \left[e^{-dT}N(Z) \times \#Options + \#Shr.own\right] \times \left(\frac{\text{Stock price}}{100}\right) \tag{2}$$

PVS (sensitivity with respect to 0.01 change in stock-return volatility) is estimated as:

$$\left[\frac{\partial(\text{Option value})}{\partial(\text{Stock volatility})}\right] \times 0.01 = e^{-dT}N'(Z) \times S\sqrt{T} \times 0.01 \times \#Options \tag{3}$$

where N'= normal density function.

When we examine whether the EBC package to CEOs lead them to suppress employee wages in order to improve the operating performance and stock-price performance, we start using both PPS and PVS as measures of EBC in the regression analysis.

4.3 Employee Wages, Capital Structure and Pay-Performance Sensitivity

In order to test Hypothesis 1 and Hypothesis 2, we run an OLS model with year and industry dummies.

$$Wage_{i,t} = \tau_0 + \tau_1 PPS_{i,t} + \tau_2 PVS_{i,t} + \tau_3 Leverage_{i,t} + \tau_4 Avgsale_{i,t} + \tau_5 MTB_{i,t}$$
$$+\tau_6 PCI_{i,t} + \tau_7 Size_{i,t} + \tau_8 \text{Quits}_{i,t} + Year_t + Ind_{i,t} + \varepsilon_{i,t} \tag{4}$$

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[4] See Black, F. and Scholes, M. (1973), Merton, R. C. (1973), and Coles, Daniel and Naveen (2006).

In this model, $PPS_{i,t}$ is the natural log of PPS to the CEO of firm *i* in year t. $PVS_{i,t}$ is the natural log of PVS to the CEO of firm i in year t. $Avgsale_{i,t}$ is the natural log of sales of per employee of firm i in year t. We use $Avgsale_{i,t}$ to gauge the productivity of employees in the firm, so we expect τ_3 to be positive. According to Berk, Stanton and Zechner (2010) who propose that companies that are more capital intensive tend to pay employee higher wages, we also include physical capital intensity variable in our model which is $PCI_{i,t}$ and expect it to be a factor influencing the employee pay positively. $\text{Quits}_{i,t}$ is the quits rates of firm *i* in year *t*. Other variables have the same definitions as in Eq. (4). $Year_t$ is the year dummy variable. $Ind_{i,t}$ is the industry dummy variable. According to Hypothesis 1 and Hypothesis 2, we expect τ_1 to be negative and τ_3 to be positive.

4.4 Heckman Two-Step Analysis

While we use labor expenses to compute average employee wages, many firms do not report labor expenses, which become missing in the COMPUSTAT database. When firms intentionally choose not to report labor expenses, the firms' choice leads to a potential sample selection bias. If firms with low PPS and with high average wage choose not to report labor expenses, our analysis can be spurious. To overcome the selection bias problem, we conduct the two-step analysis as in Heckman (1979). Chemmanur, Cheng and Zhang (2013) also recognize numerous missing values in labor expenses and perform a Heckman two-step analysis to overcome the potential selection bias. Therefore, we utilize the Heckman two-step analysis to resolve our concerns on sample-selection bias in testing Hypothesis 1 and Hypothesis 2.

In the first step, we run a Probit model of whether the data of employee pay is missing which is shown as Eq. (5). The dependent variable, $Pro_{i,t}$, is one if the firm has data of employee pay and zero otherwise. In the first step model, we include the dummies of the firm's listing exchange which is $exchg_{i,t}$ in Eq. (5) to capture different reporting behaviors by the firms. And the other variables are the same as in Eq. (4).

$$Pro_{i,t} = \alpha_1 PPS_{i,t} + \alpha_2 Leverage_{i,t} + \alpha_3 MTB_{i,t} + \alpha_4 Avgsale_{i,t} + \alpha_5 PCI_{i,t} + \alpha_6 Size_{i,t}$$
$$+ Year_t + Ind_{i,t} + exchg_{i,t} + \varepsilon_{i,t} \quad (5)$$

In the second step, we run an OLS regression model to examine the impact of PPS and firm leverage on employee wages, respectively, as is shown as Eq. (6). The data sample in this model only contains the firms of which the data of employee wages are non-missing.

$$Wage_{i,t} = \beta_0 + \beta_1 PPS_{i,t} + \beta_2 Leverage_{i,t} + \beta_3 Avgsale_{i,t} + \beta_4 MTB_{i,t} + \beta_5 PCI_{i,t} + \beta_6 Size_{i,t} + \beta_7 Imr_{i,t} + Year_t + Ind_{i,t} + \varepsilon_{i,t} \quad (6)$$

In Eq. (6), $Imr_{i,t}$ is the inverse Mills ratio generated from the selection model in the first step and then used as an independent variable in the second step. The rationality of adding the inverse Mills ratio into the regression procedure is proposed by Heckman (1979) and Tobin (1958), which is making the parameters derived from regression model unbiased. Other variables have the same definitions as in Eq. (5).

4.5 Technology Firms versus Non-Technology Firms

In this section, we study the impact of pay-performance sensitivities on employee wages in different industries to test Hypothesis 3. Based on the Standard Industrial Classification (SIC) code, we divide our data into two subsets: technology firms and non-technology firms. Technology firms are defined as the firms engaged in the fields of computer, software, internet, telecommunications and networking. Firms for which the SIC code is not less than 4000 are technology firms and otherwise are the non-technology ones. We run the regression model according to Eq. (7) which is shown as below for the technology firms and non-technology firms separately. The other variables are the same as in Eq. (4).

$$Wage_{i,t} = \tau_0 + \tau_1 PPS_{i,t} + \tau_2 Leverage_{i,t} + \tau_3 Avgsale_{i,t} + \tau_4 MTB_{i,t} + \tau_5 PCI_{i,t} + \tau_6 Size_{i,t} + Year_t + Ind_{i,t} + \varepsilon_{i,t} \quad (7)$$

We assume that the influence of pay-performance sensitivities on employee wages should be somehow different in technology firms and non-technology firms. Moreover, we run a statistical test which is shown as Eq. (8) below to examine the difference of the coefficients of PPS for average employee wage in technology firms and non-technology firms.

$$Wage_{i,t} = \gamma_0 + \gamma_1 PPS_{i,t} + \gamma_2 Leverage_{i,t} + \gamma_3 Avgsale_{i,t} + \gamma_4 MTB_{i,t} + \gamma_5 PCI_{i,t}$$
$$+\gamma_6 Size_{i,t} + \gamma_7 Tech_{i,t} + \gamma_8 (Tech \times PPS)_{i,t} + Year_t + \varepsilon_{i,t} \quad (8)$$

In this model, we use $Tech_{i,t}$ as a dummy variable, which is one if the firm is a technology firm and zero otherwise. Here, $Tech_{i,t}$ is also acting as an industry dummy variable. And we use the slope for the product of $Tech_{i,t}$ and $PPS_{i,t}$ to indicate the difference between the coefficients of pay-performance sensitivities for employee wages in technology firms and non-technology firms, which are represented as γ_{Tech} and $\gamma_{Non-Tech}$, respectively. More specifically, the term $(Tech \times PPS)_{i,t}$ will test the hypothesis which is shown below.

$$H_0: \gamma_{Tech} = \gamma_{Non-Tech} \quad ; \quad H_1: \gamma_{Tech} \neq \gamma_{Non-Tech}$$

If the term $(Tech \times PPS)_{i,t}$ is statistically significant, then we reject the null hypothesis, which means that γ_{Tech} is significantly different from $\gamma_{Non-Tech}$. And γ_8 is the difference between γ_{Tech} and $\gamma_{Non-Tech}$.

4.6 Business Cycles

We examine the impact of pay-performance sensitivities on employee wages during different business cycles to test Hypothesis 4. Recall that we measure business cycles of the firms using bankruptcy probabilities. In order to predict the possibility of a firm going into bankruptcy, we introduce Z-score firstly proposed by Altman (1968) in our model when examining the impact of PPS on employee wages. More specifically, a higher Z-score of the firm indicates a lower probability of the firm going bankrupt, which means the firm is undergoing a good state of the business cycle. When the Z-score is low, the situation is quite the opposite.

In order to include more firms when categorizing firms using Z-score, we compute Z-score using the method in line with that improved by Coles, Daniel and Naveen (2006) and Chemmanur, Cheng and Zhang (2013) based on the theory of Altman (1968): Z-score=1.2T_1+1.4T_2+3.3T_3+0.6T_4+T_5, where T_1=working capital/total assets; T_2=retained earnings/total assets; T_3=earnings before interest and taxes/total assets; T_4=market value of equity/book value of total liabilities; T_5=sales/total assets. Based on the formula, we compute the Z-score for each firm-year observation during Jan. 1992 to Dec. 2014, and then categorize the firms into financially safe firms and financially distressed firms. We define the firms with Z-score above or equal to 2.99 are financially safe firms and those with Z-score below or equal to 1.8 are financially distressed firms. We run the regression model according to Eq. (7) for the financially safe firms and financially distressed firms separately.

We conjecture that there will be some differences in the influence of pay-performance sensitivities on employee wages in different states of business cycles. Moreover, we run a statistical test which is shown as Eq. (9) below to examine the difference of the coefficients of PPS for average employee pay over business cycles.

$$\begin{aligned} Wage_{i,t} = \lambda_0 + \lambda_1 PPS_{i,t} + \lambda_2 Leverage_{i,t} + \lambda_3 Avgsale_{i,t} + \lambda_4 MTB_{i,t} + \lambda_5 PCI_{i,t} \\ + \lambda_6 Size_{i,t} + \lambda_7 State_{i,t} + \lambda_8 (State \times PPS)_{i,t} + Year_t + \varepsilon_{i,t} \end{aligned} \quad (9)$$

We use $State_{i,t}$ as a dummy variable, which is one if the firm is in a good state and zero otherwise. When we add a dummy variable indicating the state of the firm, we do not include the industry dummy variable in order to avoid the interaction effects. We use the slope for the product of $State_{i,t}$ and $PPS_{i,t}$ to indicate the difference between the coefficients of $PPS_{i,t}$ for employee wages in firms in a good state and firms in a bad state, which are represented as λ_{Good} and λ_{Bad}, respectively. More specifically, the term $(State \times PPS)_{i,t}$ will test the hypothesis which is shown below.

$$H_0: \lambda_{Good} = \lambda_{Bad} \quad ; \quad H_1: \lambda_{Good} \neq \lambda_{Bad}$$

If the term $(State \times PPS)_{i,t}$ is statistically significant, then we reject the null hypothesis, which means that λ_{Good} is significantly different from λ_{Bad}. And λ_8 is the difference between λ_{Good} and λ_{Bad}.

4.7 Robustness Checks

We check the robustness of the models with regard to two issues: endogeneity and alternative variable measures. Jensen and Meckling (1976) argue that when managers have little or no ownership of the firm, they may avoid some projects which provide positive NPVs to the firm. When the managers are given EBC, the situation will be reverse. The more investments managers try to make, the higher leverage firms will have. Agrawal and Mandelker (1987) also propose that such managerial incentives are more related to the increase of the debt-equity ratio which is defined as leverage.

As proposed by Harris and Raviv (1991) and Parsons and Titman (2009), when the firm has high leverage, the firm tends to have more tangible assets in support. Meanwhile, the firm may also need to pay employees higher wages to guarantee these assets well operated. Therefore, the positive relation between the firm leverage and employee wages emerges, which creates the potential endogeneity problem. Following the method of Wooldridge (2002), we control for this endogeneity problem by employing the instrumental variable regressions with a two-stage least-squares (2SLS) regression procedure.

In the first stage, we need to introduce an instrumental variable which is related to leverage ratio but unrelated to the employee wages. The model of the first stage is displayed as Eq. (10). Here we utilize marginal tax rates based on income before interest expense has been deducted ($MTRB_{i,t}$) as instrumental variable because it can meet the requirements (Givoly, Hayn, Ofer and Sarig, 1992). We use $(EBIT/AT)_{i,t}$ to purely capture the efficiency of a firm in generating returns from its assets, without being influenced by management financing decisions. And $STD(EBIT/AT)_{i,t}$ is the standard deviation of $(EBIT/AT)_{i,t}$, acting as a proxy for the volatility of the efficiency of squeezing profits from assets by a firm. Other variables are the same as in Eq. (6).

$$Leverage_{i,t} = \alpha_0 + \alpha_1 PPS_{i,t} + \alpha_2 MTRB_{i,t} + \alpha_3 Avgsale_{i,t} + \alpha_4 MTB_{i,t} + \alpha_5 PCI_{i,t} + \alpha_6 Size_{i,t} + \alpha_7 (EBIT/AT)_{i,t} + \alpha_8 STD(EBIT/AT)_{i,t} + Year_t + Ind_{i,t} + \delta_{i,t} \quad (10)$$

And then in the second stage, we regress the average employee wage on the fitted value of leverage derived in the first stage. The model is shown below as Eq. (11). Except for the leverage ratio, other variables are the same as in Eq. (10).

$$Wage_{i,t} = \beta_0 + \beta_1 PPS_{i,t} + \beta_2 Leverage_{i,t} + \beta_3 Avgsale_{i,t} + \beta_4 MTB_{i,t} + \beta_5 PCI_{i,t} + \beta_6 Size_{i,t} + \beta_7 (EBIT/AT)_{i,t} + \beta_8 STD(EBIT/AT)_{i,t} + Year_t + Ind_{i,t} + \varepsilon_{i,t} \quad (11)$$

We expect that after we control for the endogeneity problem, the PPS and leverage will still determine employee wages negatively and positively, respectively.

In addition, to further examine the robustness of our variables, we use another measure for the CEO's performance except for PPS, which is the excess return ($Exret_{i,t}$). Moreover, to study the interaction effect of these two variables, we add a cross product item of these two proxies which is indicated as $(Exret \times PPS)_{i,t}$. The model we construct is shown below in Eq. (12). Other variables are the same as in Eq. (4).

$$Wage_{i,t} = \tau_0 + \tau_1 PPS_{i,t} + \tau_2 Leverage_{i,t} + \tau_3 Avgsale_{i,t} + \tau_4 MTB_{i,t} + \tau_5 PCI_{i,t} + \tau_6 Size_{i,t} + \tau_7 Exret_{i,t} + \tau_8 (Exret \times PPS)_{i,t} + Year_t + Ind_{i,t} + \varepsilon_{i,t} \quad (12)$$

5. Results

We first provide the empirical findings of the income inequality in the U.S. corporations. Secondly, we further analyze how average employee pay is influenced by pay-performance sensitivity (PPS) as well as other control variables and provide more empirical findings of the regression analysis. Moreover, we investigate the relation between pay-performance sensitivities and employee wages in both technology firms and non-technology firms. Lastly, we analyze how pay-performance sensitivities affect employee wages within different business cycles.

5.1 Income Inequality

We divide the time period in our data sample into three sub-periods: 1992-2000; 2001-2007; 2008-2014, and examine the income inequality within U.S. corporations. Table 5 provides an overview of such an income inequality. First of all, Table 5 reports the ratio of average annual total labor expenses to annual total operating expenses of the firms. It shows that the ratio ranges from 18% during 2008-2014 to approximately 26% during 1992-2000, which means that the total labor expenses occupy a significant portion of total operating expenses. Therefore, it is meaningful to study the employee wages and how the difference between CEO compensation and employee wages will lead to a more severe income inequality even all over the whole society.

Table 5 also provides the comparison of average employee pay with the compensation to CEOs as well as the top 5 executives in the firms. We find that the average of annual compensation to top 5 executives is about 20 times to the average employee wage. What is even worse is that the average of annual compensation to the CEO is approximately 45-70 times more than that of an average employee. Moreover, we can find that pay-performance sensitivities of CEOs have risen from the first sub-period (1992-2000) to the second sub-period (2001-2007) and then fallen from the second sub-period (2001-2007) to the third sub-period (2008-2014), which means pay-performance sensitivities have undergone an increase followed by a decrease during the time period from 1992 to 2014 overall. This is consistent with the views of Kaplan (2012) and Frydman and Jenter (2010), who argue that the CEO pay has ascended substantially from 1993 to 2000 and then has declined from 2000 to 2010. Our findings are consistent with Kim, Kogut and Yang (2015), who also argue that the income gap between top earners including managers and executives, and lower-level employees is a primary cause for the sharp increase in the U.S. inequality since the late 1970s.

5.2 Employee Wages Analysis

In the multiple-regression analysis of employee wages, we run a series of OLS regressions using the model in Eq. (4), which are presented in Table 6. We find evidence that the average employee pay is related to PPS and firm leverage. Column 1 of Table 6 shows the relation between PPS and average employee pay and also the relation between the leverage and average employee pay, with the average sales per employee and firm size as control variables. The coefficient of PPS as -0.0310 is significant at the 1% level. With this coefficient, we compute the incremental wage changes relative to changes in PPS. Starting from the median PPS at $205,999 as shown in Table 1, we find that the level of the natural log of PPS increases by 2.8001 when we increase PPS by one standard deviation at $3,182,026, holding everything else constant. The natural log of average employee pay decreases by 0.0868 (=0.0310 $\times$ 2.8001). Considering the median employee wages is $57,503 in Table 1 and the impact of PPS on employee wages, we note that the natural log of average employee pay declines from 10.9596 to 10.8728 (=10.9596-0.0068), which are translated from $57,503 to $52,722. Therefore, the average employee wage decreases by $4,781 (or 8.31%) when a CEO with median PPS receives one standard deviation more in his PPS.

Interpreting other control variables in Column 1 of Table 6, we find that large firms pay high wages to their employees consistent with Brown and Medoff (1989). Employees are paid more as firms increase average sales per employee. Furthermore, as firms increase leverage, they pay their employees more to compensate additional risk-taking from increased leverage. These findings remain consistent in other columns and are consistent with Chemmanur, Cheng and Zhang (2013). Examining other columns in Table 6, we find that physical capital intensity and the market-to-book ratio have positive effects on average employee pay. It appears that firms with more physical capital and growth opportunities pay their employees more.

In column 5 of Table 6, we add PVS as a potential measure for EBC instead of PPS. We find that the coefficient of PVS at 0.0001 is not significant. Since PVS to the CEO does not seem to affect employee wages as expected, we focus our analysis on PPS from now on. Column 6 of Table 6 presents the result of full regression model. While the market-to-book ratio is not significant any more, other variables such as PPS, firm size, leverage, average sales per employee, and physical capital intensity remain significant as before. When we include the quits rate to the OLS estimation in Column 6 of Table 6, we note that the coefficient of quits rate is not significant at -0.0034. The annual quits rate does not seem to affect average employee pay. While Chemmanur, Cheng and Zhang (2013) find the coefficient significant when they have the quits rate alone in the regression model, they also observe that the quits ratio becomes insignificant when they include other control variables.

Since there are too many missing values of employee wages reported by firms, we further conduct a Heckman two step analysis, which is presented in Table 7. There are four columns in Table 7 and different control variables are included in the models for different columns. In the first step, we employ a Probit model, which is described in Eq. (5). Panel A of Table 7 provides the results for the first step. The coefficients of PPS in the model for each column are negative and significant at the 1% level. Firm size and firm leverage has positive and significant coefficients in the model for each column. Average sales per employee also has a positive and significant coefficient in the model for each column. In Column 3 and Column 4 of Panel A, we include physical capital intensity into the Probit estimation model. We observe that the coefficient of physical capital intensity is positive and significant in the first step estimation model. From the results of selection model presented in Panel A, we observe that larger corporations with high market leverage, lower average sales per employee, lower market-to-book ratio, and higher physical capital intensity tend to report labor expenses.

In the second step, we only choose the firms with valid employee wages data as our data sample and run a series of OLS regressions according to Eq. (6). We include the inverse Mills ratio derived from the first step as one of the independent variables in the second step model. The results for the second step regression are presented in Panel B of Table 7. We find that the coefficients of PPS in the four columns are -0.0224, -0.0237, -0.0316 and -0.0338, which are similar to each other and are all significant at the 1% level. The coefficients of leverage in the four columns are all positive and significant at the 1% level. In addition, the coefficients of the inverse Mills ratio are negative and statistically distinguishable from zero when we do not include physical capital intensity as the control variable in the regression for the second step model, which means that the inverse Mills ratio makes contribution to making parameters of the regression model unbiased. We can conclude that after we resolve the sample selection bias problem, the impacts of PPS and firm leverage on average employee wage remain negative and positive respectively, and are also significant, consistent with the results displayed in Table 6.

From the results displayed in Table 6 and Table 7, we can conclude that the average employee pay tends to increase as well when firm leverage increases. This is consistent with the findings of Chemmanur, Cheng and Zhang (2013) as well as Berk, Stanton and Zechner (2010). Moreover, CEOs with higher pay-performance sensitivities tend to suppress employee wages, which will generate higher firm performance and then get higher compensation. Hence, Hypothesis 1 and Hypothesis 2 are both supported.

5.3 Employee Wages Analysis in Technology Firms and Non-Technology Firms

In Hypothesis 3, we further examine the relationship between pay performance sensitivities and employee wages in different industries by categorizing the firms in our data sample into technology firms and non-technology firms. We run several OLS regression models based on Eq. (7). We do not include quits rate here because it is not a significant determinant to average employee wage as shown in Table 6. Table 8 reports the coefficients and standard errors obtained from OLS regressions of employee wages in technology firms and nontechnology firms separately. When testing the association between PPS and average employee wage, we use firm size and market leverage as control variables, and we add more control variables into the models in different columns. With more control variables, the adjusted R square also increases, which makes the model better to support our hypothesis. For instance, in Panel A of Table 8, the adjusted R square changes from 0.8485 in column 1 to 0.8628 in column 4. Comparing Panel A and Panel B of Table 8, we notice that the market-to-book ratio of the firm which measures the investment opportunities influence the employee wages more significantly in technology firms than in non-technology firms. In addition, we find that firm size and firm leverage have positive and significant effects on average employee wages for both technology firms and non-technology firms. More importantly, the coefficients of PPS in different columns in both Panel A and Panel B are significantly and negatively signed.

Next, we use a statistical test to examine whether there is a difference between the coefficients of PPS across technology and non-technology firms. Table 9 shows the results of the statistical test. We can note that the coefficient of the product of the dummy variable indicating whether the firm is a technology or non-technology firm and PPS is positive and statistically significant for each column. Therefore, we can conclude that the coefficient of PPS for average employee wage is bigger in non-technology firms. Overall, the effect of PPS on employee wages is greater for non-technology firms than for technology firms. More specifically, the phenomenon whereby CEOs with higher EBC will tend to pay lower employee wages is more pronounced in non-technology firms. This is plausible in that according to Berk, Stanton and Zechner (2010), the employees are more entrenched in highly levered firms. Consistent with the previous literature, non-technology firms have a higher leverage than technology firms. Therefore, employees in non-technology firms have a higher degree of entrenchment. When the employees are faced with high degree of entrenchment, they are more afraid of bankruptcy and less likely to leave the firm. Hence, their wages are more sensitive to the EBC. Therefore, Hypothesis 3 is supported.

5.4 Employee Wages Analysis over Business Cycles

In order to test Hypothesis 4, we categorize firms in our data sample into financially safe firms which means the companies are in a good state and financially distressed firms which means the companies are in a bad state. Running a series of OLS regression models based on Eq. (7), we present the results of OLS regressions of employee wages over different business cycles in Table 10. We select firm size and leverage as our main control variables. Column 3 in either Panel A or Panel B display the full-regressor model which includes all of the control variables. In full model tests for both firms in a good state and firms in a bad state, the coefficients of PPS are -0.0273 and -0.0362, respectively, which are also statistically significant at the 1% level.

The coefficients of PPS in the two states tend to be different. We use a statistical test to examine whether there is difference between the coefficients of PPS across different business cycles. Table 11 shows the results of the statistical test. We observe that the coefficient of the product of the dummy variable indicating whether the firm is in a good state or a bad state and PPS is positive and statistically significant at the 1% level for each column. Therefore, we can conclude that the coefficient of PPS for average employee wage is bigger in financially distressed firms. Overall, the effect of PPS on employee wages is greater for firms in a bad state than for firms in a good state. The finding is reasonable in the context of Berk, Stanton and Zechner (2010), who propose that employee entrenchment is higher in firms with higher leverage. One of the basic assumptions of their model is that higher leverage is related to higher probability of bankruptcy. Therefore, firms in a bad state tend to have highly entrenched employees whose wages are more sensitive to EBC. Hence, Hypothesis 4 is supported.

5.5 Robustness Checks

Table 12 and Table 13 illustrate the results of our robustness checks. Firstly, we address the endogeneity problem using a two-stage least square (2SLS) model. For the first stage, we run a series of OLS regressions based on Eq. (7) and the results are presented in Panel A of Table 12. The four columns of Panel A represent for four models with different control variables. We can find that the marginal tax rate, which is the instrumental variable, is negative and statistically significant. The full model regression in Column 4 of Panel A shows a marginal tax rate coefficient of -0.2368. The results in the first stage confirm that the marginal tax rate is a strong instrument. For the second stage, we run a series of OLS regressions based on Eq. (10) and the results are presented in Panel B of Table 12. It is apparent that firm size and average sales per employee are positive determinants and also significant at the 1% level, consistent with the findings from our OLS regressions presented in Table 6. More importantly, we notice from our second stage regression that, after utilizing the marginal tax rate as the instrumental variable to control for the potential endogeneity problem, as every column in Panel B of Table 12 illustrates, the coefficients of PPS are -0.0344, -0.0277, -0.0450 and -0.0791, which are statistically significant. Therefore, PPS continues to be a negative and significant determinant of employee wages.

Table 13 presents the results of our robustness check of changing variable measure. We also gauge the interaction effect of PPS and excess return using a cross product item of PPS and excess return. In Column 1 to Column 3 of Table 13, we replace the PPS with excess return and find that the coefficients of excess return for all of the columns are all non-significant. In Column 4 of Table 13, we run a full model test by adding PPS into the regression and find that PPS has a coefficient of -0.0254 which is significant, and excess return has a coefficient of 0.0141 which is non-significant. We can also notice that the coefficients of excess return and the interaction item are both non-significant as shown in Column 4. Therefore, PPS has a great impact on employee wages and cannot be replaced by excess return when we study the determinants of employee wages.

6. Conclusion

Executive compensation and income inequality have always been topics that are hotly discussed worldwide. In this paper, we examine the relationship between CEO equity-based compensation (EBC) and employee wages in the profitable corporations. We use pay-performance sensitivity (PPS) and pay-volatility sensitivity (PVS) to precisely measure EBC. Through comparing the wages of average employees with the total compensation of CEOs, we can find out that there is a prevalent and severe income inequality problem even inside the profitable corporations, which is also the economic significance of relationship between pay-performance sensitivities and employee wages on the income inequality all over the society.

We employ several models to provide evidence that EBC will lead to income inequality within the firms. First, we investigate the impact of PPS on average employee wage by conducting regression analysis and find out that CEOs with high EBC are more likely to suppress average employee pay to improve the firm performance, which will lead to higher CEO compensation as well as their own benefits. Hence, income inequality within the companies between CEOs and average employees is widened. Moreover, we examine such an impact in different industries. We classify firms into technology firms and non-technology firms and then provide evidence that in non-technology firms, CEOs with higher PPS are more likely to suppress employee wages. Furthermore, comparing the effects of EBC on employee wages within different business cycles, we find that in firms which are in a bad state, such an effect is stronger. Therefore, these results have practical implications for researchers and practitioners in the sense that high level of EBC do curb average employee wages and then lead to income inequality problems even within corporations. Moreover, despite the fact that EBC can mitigate the agency problem of managers and shareholders effectively, it will create another aspect of agency conflict between CEOs and shareholders. This can lead to reductions in firm value by reducing productivity and thus, expected future cash flows (or something to that effect). As a result, we suggest that firms grant EBC also to average employees based on their performance in order to reduce income inequality in modern corporations.

Even though there is some literature about how managerial powers influence employee wages, to our knowledge, no one has considered how employee wages react to PPS, especially during different business cycles. This paper contributes to the existing literature by examining the impact of EBC on employee wages directly, as well as explaining why executive compensation provided mostly by EBC will worsen income inequality in corporations and society as a whole.

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Tables

Table 1: Descriptive statistics of key variables

Variable	n	Mean	St.Dev.	Min	Q1	Median	Q3	Max
Wage	3,255	75,989.64	71,936.34	3.59	39,595.70	57,503.04	84,735.70	857,271.03
PPS	3,255	879,276.12	3,182,026.00	0	66,710.80	205,998.70	681,794.00	75,718,492.86
PVS	3,255	113,643.32	251,833.10	0	0	24,576.90	107,300.00	3,000,992.35
Size	3,255	21.62	1.66	12.96	20.00	21.54	23.00	25.98
Leverage	3,255	0.28	0.25	0	0.09	0.22	0.41	1.00
Avgsale	3,255	369,672.83	1,000,152.41	10,978.63	119,320.00	209,854.70	386,280.00	21,219,726.03
MTB	3,255	1.78	1.07	0.35	1.14	1.42	2.03	14.41
PCI	3,255	0.65	0.47	0	0.18	0.65	1.04	2.39

This table provides the descriptive statistics of the key variables. Wage is the average employee pay in the firm; PPS is the Pay Performance Sensitivity; PVS is the Pay Volatility Sensitivity; Size is the firm size; Leverage is firm leverage, which is measured as market leverage; Avgsale is the average sales per employee. MTB is market-to-book ratio of the firm; PCI is the physical capital intensity of the firm; All of the variables in the data sample also range from fiscal year 1992 to 2014. The units of the data on Wage, PPS, PVS and Avgsale are one dollar.

Table 2: Sample correlations of key variables of multivariate analysis of Employee Wages

	Wage	PPS	PVS	Size	Leverage	Avgsale	MTB	PCI
Wage	1							
PPS	**0.073**	1						
PVS	**0.132**	**0.470**	1					
Size	**0.307**	**0.575**	**0.517**	1				
Leverage	**0.138**	**-0.341**	**-0.097**	**-0.214**	1			
Avgsale	**0.684**	**0.103**	**0.143**	**0.386**	0.039	1		
MTB	**-0.120**	**0.261**	**0.072**	**0.218**	**-0.484**	**-0.065**	1	
PCI	**-0.130**	**-0.069**	-0.006	-0.005	**0.120**	-0.036	**-0.164**	1

This table provides Pearson correlations between the key variables of multivariate analysis of Employee Wages. Wage is the natural log of average employee pay in the firm; Size is the firm size; Leverage is firm leverage, which is measured as market leverage; Avgsale is the average sales per employee; MTB is market-to-book ratio of the firm; PCI is the physical capital intensity of the firm. PPS is the natural log of the Pay Performance Sensitivity; This data sample contains 2326 firm-year observations from fiscal year 1992 to 2014. Boldface indicates significance at the 1% one level.

Table 3: Sample Distribution by two-digit SIC industry classification

SIC	Industry Description	Number	Percentage (%)
01-09	Agriculture, Forestry, Fishing	20	0.54
10-14	Mining	982	26.31
15-17	Construction	22	0.59
20-39	Manufacturing	1,080	28.93
40-49	Transportation	447	11.97
50-51	Wholesale Trade	95	2.54
52-59	Retail Trade	237	6.35
70-89	Services	774	20.73
91-99	Public Administration	76	2.04
Total		3,733	100

This table shows the distribution of firms reporting data on labor expenses into different industries. The data sample is from fiscal year 1992 to 2014.

Table 4: Average employee wage in different industries by two-digit SIC industry classification

Industry	Time Period 1 (1992-2000)	Time Period 2 (2001-2007)	Time Period 3 (2008-2014)
Agriculture, Forestry, Fishing	51,551.14	50,324.43	47,280.72
Mining	164,322.93	103,821.81	116,041.05
Construction	341,523.27	41,814.83	80,761.67
Manufacturing	46,621.56	68,493.96	97,272.31
Transportation	47,376.25	215,459.12	312,661.25
Wholesale Trade	45,863.30	75,759.69	74,391.70
Retail Trade	65,480.37	17,793.34	24,446.36
Services	47,572.49	60,232.75	88,613.52
Public Administration	49,705.63	62,143.25	87,349.50

This table shows the annual average employee wage individually in different industries during the three time periods: from 1992 to 2000; from 2001 to 2007; from 2008-2014. The unit of the data on employee wage is one dollar.

Table 5: Expenses to workers of different levels during sub-periods

	Time Period 1 (1992-2000)	Time Period 2 (2001-2007)	Time Period 3 (2008-2014)
Labor Expenses	785,076,751.00	1,117,343,559.00	923,413,498.00
Operating Expenses	3,066,815,794.00	5,002,908,441.00	5,104,788,634.00
Ratio of Labor Expenses to Operating Expenses	0.26	0.22	0.18
CEO---TDC1	3,808,469.31	5,149,982.56	5,600,908.89
CEO---TDC2	3,418,681.12	5,512,447.41	7,128,673.39
CEO---PPS	1,416,486.15	1,340,814.08	780,313.52
Top 5 executives---TDC1	1,322,393.92	1,789,552.44	2,075,630.14
Top 5 executives---TDC2	1,057,739.72	1,756,548.02	2,314,893.85
Average Employee Wage	55,090.26	99,403.41	128,735.45

This table shows the comparison of average annual labor expense average with annual total operating expense as well as the comparison of the average annual compensation to CEOs and top 5 executives with the annual average employee wage in the firm during the three time periods: from 1992 to 2000; from 2001 to 2007; and from 2008-2014. TDC1 is total compensation which is comprised of: salary, bonus, other annual, total value of restricted stock granted, total value of stock options granted (using Black-Scholes), long-term incentive payouts, and all other total. TDC2 is also total compensation which is measured in another way. TDC2 is composed of: salary, bonus, other annual, total value of restricted stock granted, net value of stock options exercised, long-term incentive payouts, and all other total. PPS is the Pay Performance Sensitivity. All of the data items in this table are collected individually. The units of the data on Employee Wages, Operating Expenses, TDC1, TDC2, PPS and Average Employee Wage are one dollar.

Table 6: Ordinary least square (OLS) regressions of Employee Wages

Wage	(1)	(2)	(3)	(4)	(5)	(6)
PPS	-0.0310***	-0.0306***	-0.0303***	-0.0300***		-0.0339***
	(0.0073)	(0.0073)	(0.0073)	(0.0073)		(0.0104)
PVS					0.0001	
					(0.0056)	
Firm Size	0.0442***	0.0468***	0.0425***	0.0473***	0.0473***	0.0485***
	(0.0073)	(0.0073)	(0.0072)	(0.0081)	(0.0081)	(0.0106)
Leverage	0.2893***	0.2286***	0.2693***	0.3889***	0.3889***	0.2827***
	(0.0457)	(0.0492)	(0.0454)	(0.0562)	(0.0562)	(0.0655)
Average sales per	0.3806***	0.3804***	0.3853***	0.3451***	0.3451***	0.4124***
employee	(0.0162)	(0.0162)	(0.0161)	(0.0198)	(0.0198)	(0.0209)
Market-to-Book		-0.0331***		-0.0252**	-0.0401***	-0.0242
Ratio		(0.0100)		(0.0100)	(0.0122)	(0.0154)
Physical capital			0.2023***	0.1924***	0.1794***	0.1952***
intensity			(0.0307)	(0.0310)	(0.0369)	(0.0449)
Quits Rate						-0.0034
						(0.0059)
Intercept	4.7709***	4.8118***	4.5075***	4.5515***	4.9813***	4.3302***
	(0.2184)	(0.2182)	(0.2200)	(0.2205)	(0.4437)	(0.3465)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Obs	2326	2326	2326	2326	1813	1316
Adj R^2	0.7231	0.7243	0.7282	0.7288	0.7088	0.7325

This table reports the coefficients and standard errors of the regressors in the OLS regression model of average employee wage. The dependent variable is the average employee wage. Wage is the natural log of average employee pay in the firm; PPS is the natural log of the Pay Performance Sensitivity; PVS is the natural log of the Pay Volatility Sensitivity; Leverage is measured as market leverage; The Quits Rate is collected from 2001 to 2014. The other variables in the data sample range from fiscal year 1992 to 2014. Numbers in the parentheses are the standard errors.*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively.

Table 7: Heckman two step analysis of Employee Wages

Panel A: First Step---Probit model of firms reporting data on employee wages

Pro	(1)	(2)	(3)	(4)
PPS	-0.0729***	-0.0683***	-0.0645***	-0.0600***
	(0.0101)	(0.0102)	(0.0102)	(0.0103)
Firm Size	0.1840***	0.1917***	0.1882***	0.1952***
	(0.0113)	(0.0114)	(0.0114)	(0.0115)
Leverage	0.3417***	0.1980**	0.3002***	0.1671**
	(0.0758)	(0.0816)	(0.0765)	(0.0820)
Average sales per	-0.2527***	-0.2502***	-0.2602***	-0.2580***
employee	(0.0150)	(0.0187)	(0.0188)	(0.0189)
Market-to-Book		-0.0684***		-0.0640***
Ratio		(0.0138)		(0.0137)
Physical capital			0.5199***	0.5172***
intensity			(0.0410)	(0.0412)
Firm's Exchange dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Obs	26286	26286	26286	26286

Panel B: Second Step---OLS regression of employee wages in firms with data on employee wages

Wage	(1)	(2)	(3)	(4)
PPS	-0.0224***	-0.0237***	-0.0316***	-0.0338***
	(0.0076)	(0.0076)	(0.0078)	(0.0078)
Firm Size	0.0161	0.0230**	0.0468***	0.0576***
	(0.0102)	(0.0106)	(0.0117)	(0.0123)
Leverage	0.2314***	0.1999***	0.2770***	0.2392***
	(0.0478)	(0.0499)	(0.0483)	(0.0501)
Average sales per	0.4112***	0.4055***	0.3809***	0.3718***
employee	(0.0179)	(0.0181)	(0.0187)	(0.0190)

Market-to-Book Ratio		-0.0229** (0.0105)		-0.0295*** (0.0105)
Physical capital intensity			0.1627*** (0.0459)	0.2150*** (0.0410)
Inverse Mills Ratio	-0.9674*** (0.2433)	-0.7926*** (0.2560)	0.1509 (0.3224)	0.4434 (0.3384)
Intercept	5.4292*** (0.2735)	5.3385*** (0.2764)	4.3883*** (0.3366)	4.2087*** (0.3421)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Obs	2326	2326	2326	2326
Adj R^2	0.7249	0.7253	0.7281	0.7289

This table reports the coefficients and standard errors obtained from a Heckman two-step analysis model of average employee wage. In the first step, we employ a probit model of whether the firm has data on employee wages. The dependent variable in the model for the first step is denoted as “pro”. And it is one if the data on employee wages are not missing and zero otherwise. In the second step, we run an OLS regression model of employee wages. The dependent variable in the model for the second step is the average employee wage. The inverse mills ratio derived from the selection model for the first step is added into the OLS regression for the second step as an independent variable. Wage is the natural log of average employee pay in the firm; PPS is the natural log of the Pay Performance Sensitivity; Leverage is measured as market leverage. All of the variables in the data sample for both the first and second steps range from fiscal year 1992 to 2014. Numbers in the parentheses are the standard errors.*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively.

Table 8: Pay-Performance Sensitivity and Employee Wages: OLS regressions in technology firms and non-technology firms

Variables	*Panel A: Technology Firms*				*Panel B: Non-Technology Firms*			
Wage	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
PPS	-0.0243***	-0.0228***	-0.0244***	-0.0233***	-0.0525**	-0.0503**	-0.0483**	-0.0456**
	(0.0064)	(0.0063)	(0.0061)	(0.0061)	(0.0211)	(0.0212)	(0.0211)	(0.0211)
Firm Size	0.0336***	0.0395***	0.0259***	0.0309***	0.0945***	0.0919***	0.1078***	0.1054***
	(0.0065)	(0.0065)	(0.0063)	(0.0063)	(0.0200)	(0.0200)	(0.0205)	(0.0205)
Leverage	0.2402***	0.1335***	0.1779***	0.1028**	0.5907***	0.6631***	0.6539***	0.7361***
	(0.0401)	(0.0426)	(0.0388)	(0.0412)	(0.1289)	(0.1391)	(0.1305)	(0.1410)
Average sales	0.4330***	0.4333***	0.4610***	0.4591***	0.1487***	0.1500***	0.0877	0.0872
per employee	(0.0139)	(0.0137)	(0.0136)	(0.0135)	(0.0498)	(0.0498)	(0.0547)	(0.0546)
Market-to-Book		-0.0588***		-0.0439***		0.0384		0.0426
Ratio		(0.0087)		(0.0085)		(0.0279)		(0.0278)
Physical capital			0.3259***	0.3022***			0.2239***	0.2309***
intensity			(0.0281)	(0.0283)			(0.0845)	(0.0845)
Intercept	4.5088***	4.5414***	3.9797***	4.0424***	7.1848***	7.0888***	7.3749***	7.2747***
	(0.1962)	(0.1935)	(0.1937)	(0.1925)	(0.7363)	(0.7391)	(0.7366)	(0.7388)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1586	1586	1586	1586	740	740	740	740
Adj R^2	0.8485	0.8528	0.8606	0.8628	0.3312	0.3321	0.3370	0.3383

This table reports the coefficients and standard errors of the regressors in the OLS regression model of average employee wage in technology firms and nontechnology firms, respectively. The dependent variable is the average employee wage. Wage is the natural log of average employee pay in the firm; PPS is the natural log of the Pay Performance Sensitivity; Leverage is measured as market leverage. All of the variables in the data sample range from fiscal year 1992 to 2014. Numbers in the parentheses are the standard errors.*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively.

Table 9: Difference of coefficients of Pay-Performance Sensitivity for Employee Wages in technology firms and non-technology firms

Wage	(1)	(2)	(3)	(4)
PPS	-0.0634***	-0.0633***	-0.0741***	-0.0745***
	(0.0160)	(0.0160)	(0.0158)	(0.0158)
Technology	-0.4880**	-0.4935**	-0.6227***	-0.6367***
	(0.2055)	(0.2053)	(0.2026)	(0.2021)
Product of Technology and PPS	0.0572***	0.0576***	0.0683***	0.0695***
	(0.0167)	(0.0167)	(0.0164)	(0.0164)
Firm Size	0.0470***	0.0505***	0.0498***	0.0548***
	(0.0096)	(0.0097)	(0.0095)	(0.0096)
Leverage	0.3107***	0.2459***	0.3699 ***	0.2808***
	(0.0575)	(0.0629)	(0.0569)	(0.0619)
Average sales per employee	0.5877***	0.5839***	0.5754***	0.5696***
	(0.0151)	(0.0152)	(0.0149)	(0.0150)
Market-to-Book Ratio		-0.0332**		-0.0470***
		(0.0132)		(0.0130)
Physical capital intensity			-0.2658***	-0.2780***
			(0.0296)	(0.0297)
Intercept	3.1915***	3.2524***	3.6376***	3.7444***
	(0.2901)	(0.2908)	(0.2895)	(0.2902)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Obs	2326	2326	2326	2326
Adj R^2	0.4770	0.4782	0.4945	0.4971

This table reports the difference of the coefficients of PPS on employee wages in different industries. Technology is a dummy variable, which is one if the firm is a technology firm, and zero otherwise. The dependent variable is the average employee wage. Wage is the natural log of average employee pay in the firm; PPS is the natural log of the Pay Performance Sensitivity; Product of Technology and PPS is the product of dummy variable and PPS; Leverage is measured as market leverage. All of the variables in the data sample range from fiscal year 1992 to 2014. Numbers in the parentheses are the standard errors.*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively.

Table 10: Pay-Performance Sensitivity and Employee Wages over business cycles

Variables	*Panel A: Financially Safe Firms*			*Panel B: Financially Distressed Firms*		
Wage	(1)	(2)	(3)	(1)	(2)	(3)
PPS	-0.0287***	-0.0242**	-0.0273***	-0.0362***	-0.0388***	-0.0362***
	(0.0105)	(0.0105)	(0.0104)	(0.0129)	(0.0130)	(0.0129)
Firm Size	0.0448***	0.0576***	0.0540***	0.0406***	0.0395***	0.0409***
	(0.0112)	(0.0115)	(0.0115)	(0.0142)	(0.0143)	(0.0142)
Leverage	0.0914	0.0005	-0.1229	0.2331***	0.2031***	0.2228***
	(0.1429)	(0.1535)	(0.1544)	(0.0650)	(0.0725)	(0.0722)
Average sales per	0.3769***	0.3692***	0.3756***	0.3861***	0.3800***	0.3867***
employee	(0.0231)	(0.0232)	(0.0230)	(0.0277)	(0.0280)	(0.0278)
Market-to-Book		-0.0564***	-0.0502***		-0.0167	-0.0063
Ratio		(0.0141)	(0.0140)		(0.0192)	(0.0193)
Physical capital	0.2541***		0.2378***	0.1648***		0.1619***
intensity	(0.0496)		(0.0496)	(0.0511)		(0.0519)
Intercept	4.6239***	4.8499***	4.6141***	4.3764***	4.7134***	4.3864***
	(0.3439)	(0.3417)	(0.3424)	(0.4066)	(0.3977)	(0.4081)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1367	1367	1367	563	563	563
Adj R^2	0.6956	0.6933	0.6983	0.7701	0.7658	0.7697

This table reports the coefficients and standard errors of the regressors in the OLS regression model of average employee wage within different business cycles. The dependent variable is the average employee wage. Wage is the natural log of average employee pay in the firm; PPS is the natural log of the Pay Performance Sensitivity; Leverage is measured as market leverage. All of the variables in the data sample range from fiscal year 1992 to 2014. Numbers in the parentheses are the standard errors.*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively.

Table 11: Difference of coefficients of Pay-Performance Sensitivity for Employee Wages over business cycles

Wage	(1)	(2)	(3)
PPS	-0.0437***	-0.0426***	-0.0503***
	(0.0159)	(0.0161)	(0.0159)
State	-0.7694***	-0.7918***	-0.9175***
	(0.2204)	(0.2263)	(0.2234)
Product of State and	0.0495***	0.0483***	0.0604***
PPS	(0.0178)	(0.0182)	(0.0180)
Firm Size	0.0323***	0.0376***	0.0397***
	(0.0104)	(0.0107)	(0.0106)
Leverage	0.1335*	-0.0302	0.0204
	(0.0754)	(0.0823)	(0.0812)
Average sales per	0.5225***	0.5357***	0.5152***
employee	(0.0158)	(0.0159)	(0.0159)
Market-to-Book		-0.0395***	-0.0526***
Ratio		(0.0145)	(0.0144)
Physical capital	-0.2593***		-0.2743***
intensity	(0.0350)		(0.0352)
Intercept	4.6022***	4.2473***	4.7878***
	(0.2980)	(0.2978)	(0.3013)
Year Dummy	Yes	Yes	Yes
Industry Dummy	No	No	No
Obs	1930	1930	1930
Adj R^2	0.4653	0.4520	0.4687

This table reports the difference of the coefficients of PPS on employee wages over business cycles. State is a dummy variable, which is one if the firm is in a good state, and zero otherwise. The dependent variable is the average employee wage. Wage is the natural log of average employee pay in the firm; PPS is the natural log of the Pay Performance Sensitivity; Product of State and PPS is the product of dummy variable and PPS; Leverage is measured as market leverage. All of the variables in the data sample range from fiscal year 1992 to 2014. Numbers in the parentheses are the standard errors.*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively.

Table 12: Instrumental variable regressions of Employee Wages: Two stage least square regression analysis

Panel A: First Stage---Leverage is the dependent variable

Leverage	(1)	(2)	(3)	(4)
PPS	-0.0447***	-0.0367***	-0.0445***	-0.0316***
	(0.0033)	(0.0031)	(0.0033)	(0.0030)
Marginal Tax	-0.6955***	-0.8397***	-0.6672***	-0.2421**
Rate	(0.1147)	(0.1057)	(0.1155)	(0.1144)
Firm Size	0.0010	0.0091***	0.0004	0.0089***
	(0.0036)	(0.0033)	(0.0036)	(0.0032)
Average sales	0.0084	0.0059	0.0190	0.0125*
per employee	(0.0077)	(0.0071)	(0.0077)	(0.0068)
Market-to-Book		-0.0819***		-0.0478***
Ratio		(0.0041)		(0.0047)
Physical capital			0.0305**	-0.0126
intensity			(0.0149)	(0.0133)
EBIT/AT				-0.9849***
				(0.0691)
STD(EBIT/AT)				-0.3863**
				(0.1528)
Intercept	0.8527***	0.8377***	0.8137***	0.5976***
	(0.0962)	(0.0884)	(0.0980)	(0.0922)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Obs	2176	2176	2176	2176
Adj R^2	0.2744	0.3873	0.2755	0.4402

Panel B: Second Stage---Average Employee pay is the dependent variable

Wage	(1)	(2)	(3)	(4)
PPS	-0.0344*	-0.0277**	-0.0450**	-0.0791*
	(0.0185)	(0.0139)	(0.0192)	(0.0452)

Leverage	0.1922	0.2725	-0.0783	-1.4543
(Instrumented)	(0.3612)	(0.2990)	(0.3810)	(1.3867)
Firm Size	0.0430***	0.0460***	0.0391***	0.0522***
	(0.0077)	(0.0076)	(0.0078)	(0.0141)
Average sales	0.3692***	0.3675***	0.3749***	0.3984***
per employee	(0.0170)	(0.0168)	(0.0172)	(0.0265)
Market-to-Book		-0.0317		-0.0784
Ratio		(0.0257)		(0.0646)
Physical capital			0.2029***	0.1504***
intensity			(0.0361)	(0.0406)
EBIT/AT				-2.3851
				(1.4542)
STD(EBIT/AT)				-1.8933***
				(0.6301)
Intercept	4.9783***	4.9041***	4.9498***	5.7060***
	(0.3485)	(0.3041)	(0.3488)	(0.7961)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Obs	2176	2176	2176	2176
Adj R^2	0.7217	0.7240	0.7212	0.6544

This table reports the coefficients and standard errors obtained from the instrumental variable regressions of employee wages. We implement two stage least square (2SLS) regression model. In the first stage, we use the marginal tax rate based on income before interest expense has been deducted (MTRB) as the instrumental variable. And the dependent variable is leverage which is measured as market leverage. In the second stage, the fitted value of leverage derived from the first stage is included in the OLS regression model as an independent variable. The dependent variable in the model for the second stage is average employee wage. Wage is the natural log of average employee pay in the firm; PPS is the natural log of the Pay Performance Sensitivity. All of the variables in the data sample for both the first and second stages range from fiscal year 1992 to 2012. Numbers in the parentheses are the standard errors.*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively.

Table 13: Interaction effect of Pay-Performance Sensitivity and Excess return in the OLS regressions of Employee Wages

Wage	(1)	(2)	(3)	(4)
PPS				-0.0254**
				(0.0119)
Firm Size	0.0538***	0.0633***	0.0537***	0.0734***
	(0.0070)	(0.0070)	(0.0070)	(0.0076)
Leverage	0.5058***	0.2737***	0.4948***	0.2282***
	(0.0611)	(0.0697)	(0.0608)	(0.0696)
Average sales	0.3156***	0.3008***	0.3065***	0.2925***
per employee	(0.0194)	(0.0191)	(0.0195)	(0.0191)
Market-to-Book		-0.0946***		-0.0899***
Ratio		(0.0148)		(0.0147)
Physical capital			0.1186***	0.1216***
intensity			(0.0364)	(0.0353)
Excess return	0.0068	0.0129	0.0078	0.0141
	(0.0080)	(0.0079)	(0.0080)	(0.0632)
Cross product item of PPS and Excess return				0.0001 (0.0051)
Intercept	4.8146***	5.1019***	4.7537***	5.1124***
	(0.2537)	(0.2515)	(0.2528)	(0.2677)
Year Dummy	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes
Obs	843	843	843	843
Adj R^2	0.8480	0.8554	0.8499	0.8590

This table reports the coefficients and standard errors of the regressors in the OLS regression model of average employee wage with examining the robustness of PPS using excess return. The dependent variable is the average employee wage. Wage is the natural log of average employee pay in the firm; PPS is the natural log of the Pay Performance Sensitivity; Leverage is measured as market leverage. We also include a cross product item of PPS and excess return, which can capture the interaction effect of these two variables in the regression model. All of the variables in the data sample range from fiscal year 1992 to 2014. Numbers in the parentheses are the standard errors.*, **, and *** indicate statistical significance at 10%, 5% and 1% level, respectively.